

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 03-F-100PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2004/004152	International filing date (day/month/year) 25.03.2004	Priority date (day/month/year) 27.03.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant NATIONAL INSTITUTE FOR MATERIALS SCIENCE		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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Box No. I

Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-2, 4-13 as originally filed/furnished
- pages* 3 received by this Authority on 27.07.2004
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. 2-8 as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1 received by this Authority on 27.07.2004
- nos.* _____ received by this Authority on _____
- ☒ the drawings:
- sheets 1-13 as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p>Document 1: JP 2001-101645 A (Akita Prefecture), 13 April 2001, entire text; fig. 1 to 10</p> <p>Document 2: JP 2002-208129 A (Hitachi Maxell, Ltd.), 26 July 2002, paragraphs [0026] to [0031]; fig. 1 & WO 02/39433 A & AU 1274302 A</p> <p>Document 3: JP 2002-216330 A (Toshiba Corporation), 2 August 2002, paragraphs [0025] to [0035]; fig. 1, 4 and 9 & US 2002-098383 A</p> <p>Claims 1 to 8</p> <p>Document 1 sets forth a high-density information recording medium and a method for producing said medium, wherein a MgO film and a base film (40) comprising MgO, NiO or the like are formed on a substrate, and a layer (30) comprising Fe, and Fe-Ni alloy, a layer (20) comprising a non-magnetic material such as MgO, and a L10 ordered alloy information recording layer (10) of an ordered FePt alloy are sequentially formed thereupon. Document 1 also sets forth a feature wherein film growth is carried out at a substrate temperature of 300°C by RF sputtering using an FePt alloy (ratio of elements in the composition: Fe/Pt = 1) sputter target with a film thickness of 13nm; and a feature wherein the layer (20)</p>			

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
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comprising non-magnetic material can control the crystallinity and crystal orientation of the L10 ordered alloy thin film layer according to the non-magnetic material employed, and if MgO is used, the crystallinity and crystal orientation of the L10 ordered alloy information recording layer (10) is improved.

Document 2 sets forth a magnetic recording medium, wherein a non-magnetic orientation control layer (7) comprising a non-magnetic metal having an fcc crystalline structure containing at least one of Pt, Au, Cu and a MgO film is formed between a backing layer (5) containing Fe and a magnetic recording layer (9) of ordered FePt alloy having an L10 crystalline structure in order to improve the crystal orientation of the magnetic recording layer; and the ratio of elements Fe and P is $0.45 \leq (\text{Fe}+\text{Pt}) \leq 0.55$.

In addition, in order to improve the crystal orientation of the ordered FePt alloy of a magnetic recording medium using an ordered FePt alloy as a magnetic recording layer, it would be easy for a person skilled in the art to conceive of employing a non-magnetic orientation control layer comprising a non-magnetic material having an fcc crystalline structure containing at least one of Pt, Au and Cu as set forth in document 2 as an alternative to the MgO film set forth in document 1, and to set the ratio of Fe to Fe+Pt to around 45 atom%.

Document 3 cited in the international search report sets forth a magnetic recording medium, wherein it is preferable that the composition ratio of Fe:Pt falls

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within the range of 4:6 to 6:4, and that if the ratio falls within this range an ordered phase having an L10 structure is formed.